ASED http://e-ASED.org
Animal Systematics, Evolution and Diversity

Anim. Syst. Evol. Divers. Vol. 34, No. 2: 119-125, April 2018
https://doi.org/10.5635/ASED.2018.34.2.009

Short communication

A New Record of the Genus *Anonyx* (Crustacea: Amphipoda: Uristidae) from Korean Waters

Jun-Haeng Heo, Young-Hyo Kim*

Department of Life Sciences, Dankook University, Cheonan 31116, Korea

ABSTRACT

A newly recorded species of lysianassid amphipod, *Anonyx schefferi* Steele, 1986 which belongs to the family Uristidae Hurley, 1963 was collected from the East Sea of Korea. The genus *Anonyx* Krøyer, 1838 was subdivided into five groups mainly based on the amount of constriction of the inner ramus of uropod 2: *A. bispinosus* group, *A. compactus* group, *A. laticoxae* group, *A. nugax* group, *A. validus* group. *Anonyx schefferi* is included in one of the *A. laticoxae* group. This species is similar to *Anonyx laticoxae* Gurjanova, 1962, but *A. schefferi* is characterized by an unconstricted inner ramus of uropod 2 and an upturned epimeron 3 posteroventrally. The species is described and fully illustrated in the present study.

Keywords: Amphipoda, Lysianassoidea, Uristidae, *Anonyx*, Korea

INTRODUCTION

Lysianassoid amphipods are well known as dominant scavengers in the cold-water seas such as polar and deep-sea areas (Sainte-Marie, 1992; Takekawa and Ishimaru, 2001). The family Uristidae Hurley, 1963 is one of the 12 families in Lysianassoidea and the genus *Anonyx* Krøyer, 1838 composed of 50 species, is the most significant genus within family Uristidae (WoRMS, 2018). Diagnostic characteristics of the genus *Anonyx* are as follows: (1) antenna 1, peduncular article 1 without anterodistal lobe; (2) accessory flagellum forming cap covering callynophore; (3) antenna 2 with brush setae; (4) gnathopod 1 subchelate (occasionally parachelate), propodus slightly tapering distally (Lowry and Kilgallen, 2014). The genus was subdivided into five groups mainly based on the amount of constriction of the inner ramus of uropod 2 as follows: (1) *Anonyx laticoxae* group whose species without a constriction of the inner ramus of uropod 2; (2) *A. validus* group whose species with an inner ramus of uropod 2 expanded laterally and lacking a constriction; (3) *A. nugax* group whose species with a constriction of the inner ramus at the point of insertion of the distal spine; (4) *A. compactus* group whose species with an inner ramus that is completely constricted beyond the point of insertion of the distal spine; and (5) *A. bispinosus* group whose species with an inner ramus completely constricted beyond the point of insertion of the distal spine, and the proximal portion of the inner ramus laterally flattened (Steele, 1979, 1982, 1983, 1986, 1989, 1991; Takekawa and Ishimaru, 2001). Among these groups, *A. schefferi* Steele, 1986 belongs to the *A. laticoxae* group which has no constricted inner ramus of uropod 2. There are 12 species reported in *A. laticoxae* group worldwide: *A. affinis* Ohlin, 1855, *A. exilipes* Jung, Coleman, Kim and Yoon, 2018, *A. gurjanovai* Steele, 1986, *A. hurleyi* Steele, 1986, *A. laticoxae* Gurjanova, 1962, *A. multiarticulatus* (Pearse, 1913), *A. orientalis* (Gurjanova, 1962), *A. petersoni* Steele, 1986, *A. schefferi*, *A. sculptifer* Gujanova, 1962, *A. stegnegeri* Steele, 1986 and *A. volkovi* Kudrjaschov, 1965.

Specimens were collected by rinsing the fishing net from subtidal waters of East Sea of Korea. They are deposited at the National Institute of Biological Resources (NIBR), Incheon, Korea and the Department of Biological Science, Dankook University (DKU), Cheonan, Korea.

SYSTEMATIC ACCOUNTS

Order Amphipoda Latreille, 1816
Suborder Gammaridea Latreille, 1803

*To whom correspondence should be addressed
Tel: 82-41-550-3442, Fax: 82-41-559-7861
E-mail: yhkim@dankook.ac.kr

eISSN 2234-8190

Superfamily Lysianassoidea Dana, 1849
Family Uristidae Hurley, 1963
Genus *Anonyx* Krøyer, 1838

[1*]***Anonyx schefferi* Steele, 1986 (Figs. 1–4)**

Anonyx schefferi Steele, 1986: 2604, figs. 2–5.

Material examined. 1♂, 56♀♀, Korea: Gangwon-do, Goseong-gun, Geojin-eup, Geojin-ri, Geojin Port, 38°26′39″ N, 128°27′34″E, 2 Feb 1986, Lee KS (DKUAMP201801); Goseong-gun, Geojin-eup, Geojin-ri, Geojin Port, 38°26′38″ N, 128°27′35″E, 23 Apr 1986 (3♂♂, 7♀♀, DKUAMP 201802) in the collection of the corresponding author.

Description. Male (cat No. NIBRIV0000816431): body 13.8 mm long.

Head (Fig. 2A) lateral cephalic lobe rounded, expanded anteriorly; eye large, reniform, reddish brown.

Epimeron 1 (Fig. 2D) subrounded posteroventrally; epimeron 2 weakly produced posteroventrally with small cusp; epimeron 3 rounded posteroventrally with unturned prominent tooth.

Antenna 1 (Fig. 2B) half as long as antenna 2; peduncular article 1 swollen with a row of penicillate setae near ventral margin; peduncular articles 2–3 strongly telescoping, short; length ratio of peduncular articles 1–3 = 1.00 : 0.14 : 0.14; primary flagellum long, 1.7 times as long as peduncle, 25-articulate; accessory flagellum 9-articulate, flagellum article 1 rather elongate; calceoli absent.

Antenna 2 (Fig. 2C) elongate; peduncular article 4 about 1.44 times as long as article 5, with row of setules dorsally; flagellum 69-articulate; caleoli absent.

Upper lip slightly projecting in front of the epistome.

Lower lip (Fig. 2E) lacking inner lobe, outer lobe with densely pubescent and elongated mandibular process.

Right mandible (Fig. 2F), incisor broad and smooth with 1 large and 1 small teeth on each side of cutting edge; accessory spine row with 5 setaceous spines, 3 spines and 4 spinules; molar process well developed, columnar, distally truncate and triturative, densely pubescent; palp attached nearly midway, 3-articulate; article 1 short; article 2 longest, with 9 A2-setae; article 3 0.64 times as long as article 2, weakly falcate, with 2 B3-setae, 17 D3-setae, 2 E3-setae, and 2 F3-setae.

Left mandible (Fig. 2G) similar to left one, except for the bifid tooth on the cutting edge.

Maxilla 1 (Fig. 2H), inner plate small, with 2 apical pectinate setae; outer plate with 11 dentate spine-teeth; palp biarticulate, proximal article short, distal article with 8 blunt spines apically.

Maxilla 2 (Fig. 2I), inner plate tapering apically, with a row of pectinate setae medially, several simple setae distally; outer plate 1.53 times longer than inner one, with pectinate and simple setae.

Maxilliped (Fig. 2J), inner plate rectangular, with row of 8 plumose setae medially, apical margin with 1 slender simple seta and 1 tiny seta; outer plate subovate, reaching less than distal end of article 2 of palp; palp 4-articulate, article 1 slightly shorter than article 2; article 2 with 15 simple setae medially; article 4 falcate.

Gnathopod 1 (Fig. 3A) subchelate; coxa large, expanded anteriorly; both margins of basis with simple setae; carpus with two clusters of simple setae distally; propodus subrect-

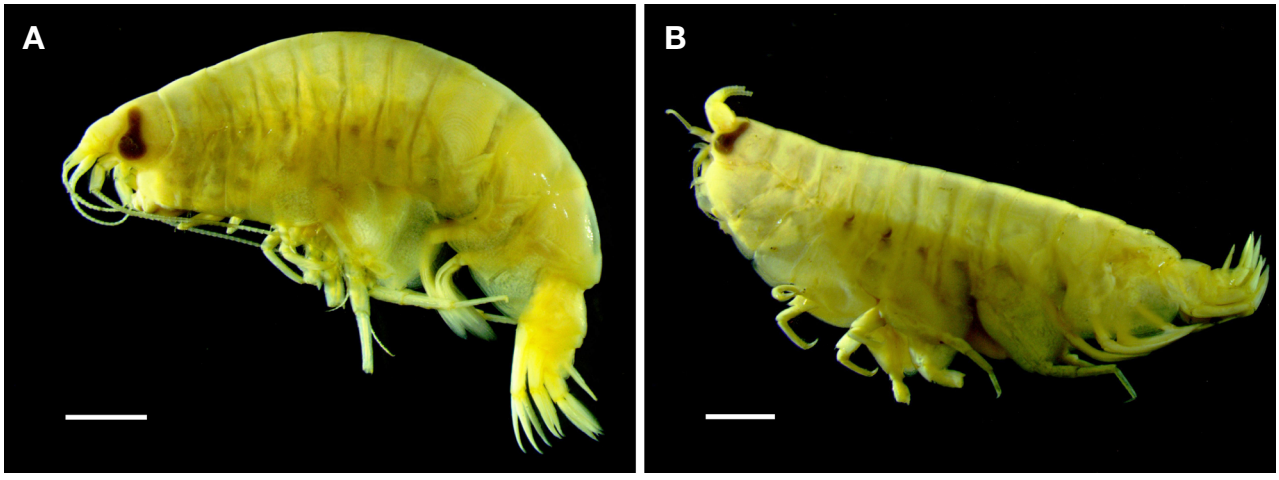

Fig. 1. *Anonyx schefferi* Steele, 1986. A, Male, 28.3 mm; B, Female, 24.4 mm, Geojin Port, Goseong-gun, Gangwon-do, Korea. Scale bars: A, B = 3 mm.

Korean name: [1*]솟은돌기나도긴팔옆새우(신칭)

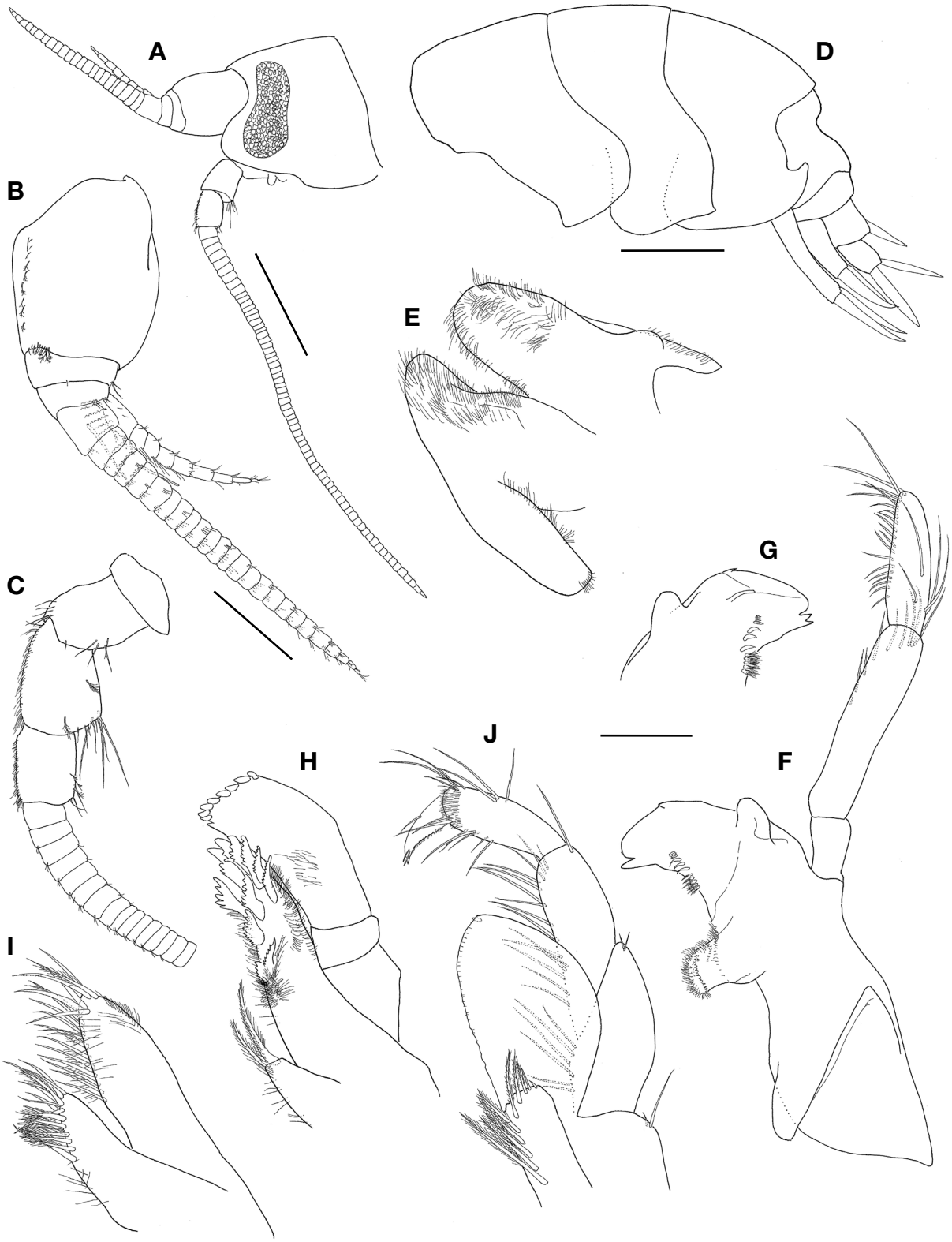

Fig. 2. *Anonyx schefferi* Steele, 1986, male, 13.8 mm. A, Head; B, Antenna 1; C, Antenna 2; D, Epimeral plates 1–3; E, Lower lip; F, Right mandible; G, Left mandible; H, Maxilla 1; I, Maxilla 2; J, Maxilliped. Scale bars: A, D = 1.0 mm, B, C = 0.4 mm, E–J = 0.2 mm.

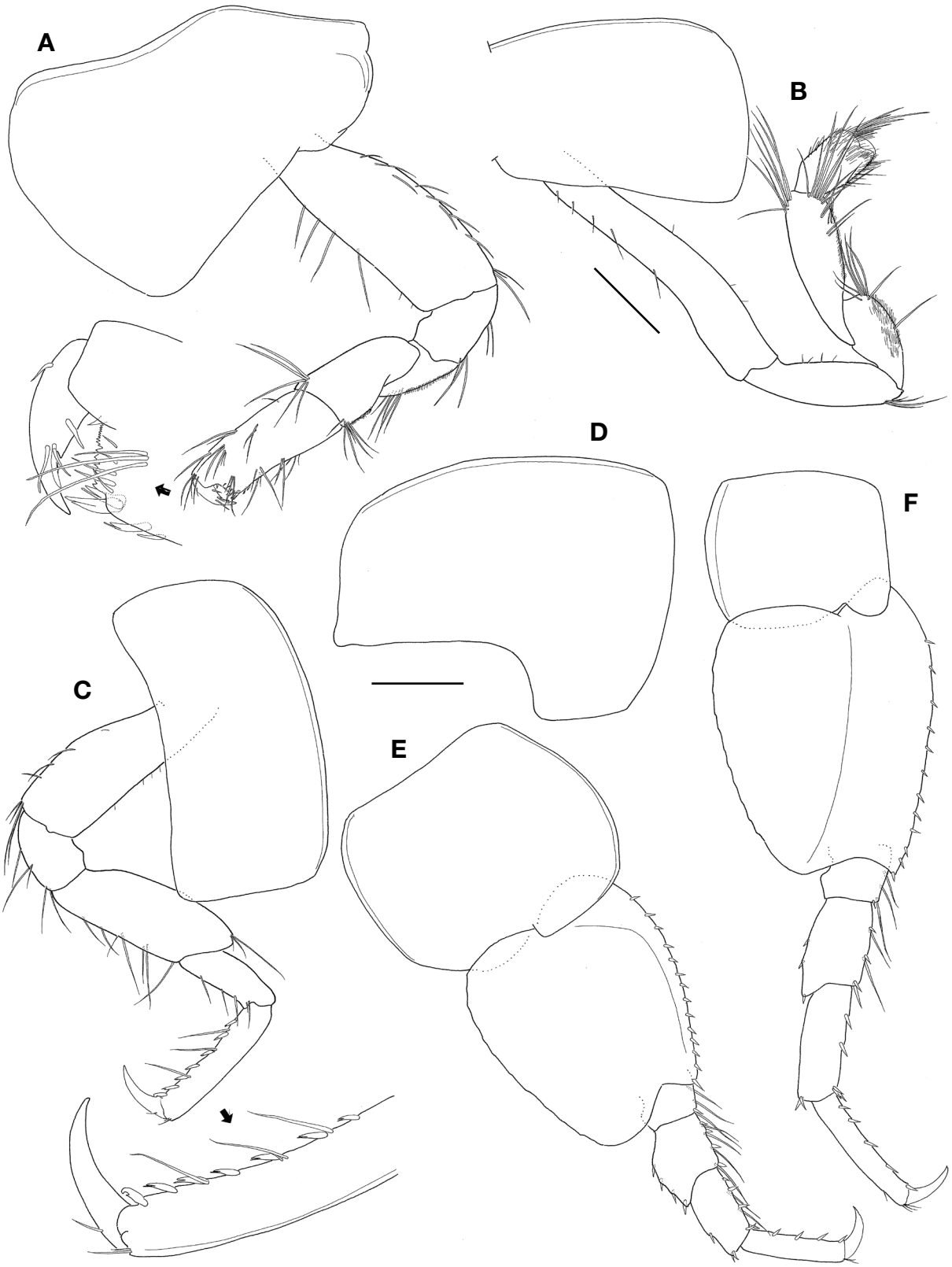

Fig. 3. *Anonyx schefferi* Steele, 1986, male, 13.8 mm. A, Gnathopod 1; B, Gnathopod 2; C, Pereopod 3; D, Coxa 4; E, Pereopod 5; F, Pereopod 6. Scale bars: A, B = 0.4 mm, C–F = 0.5 mm.

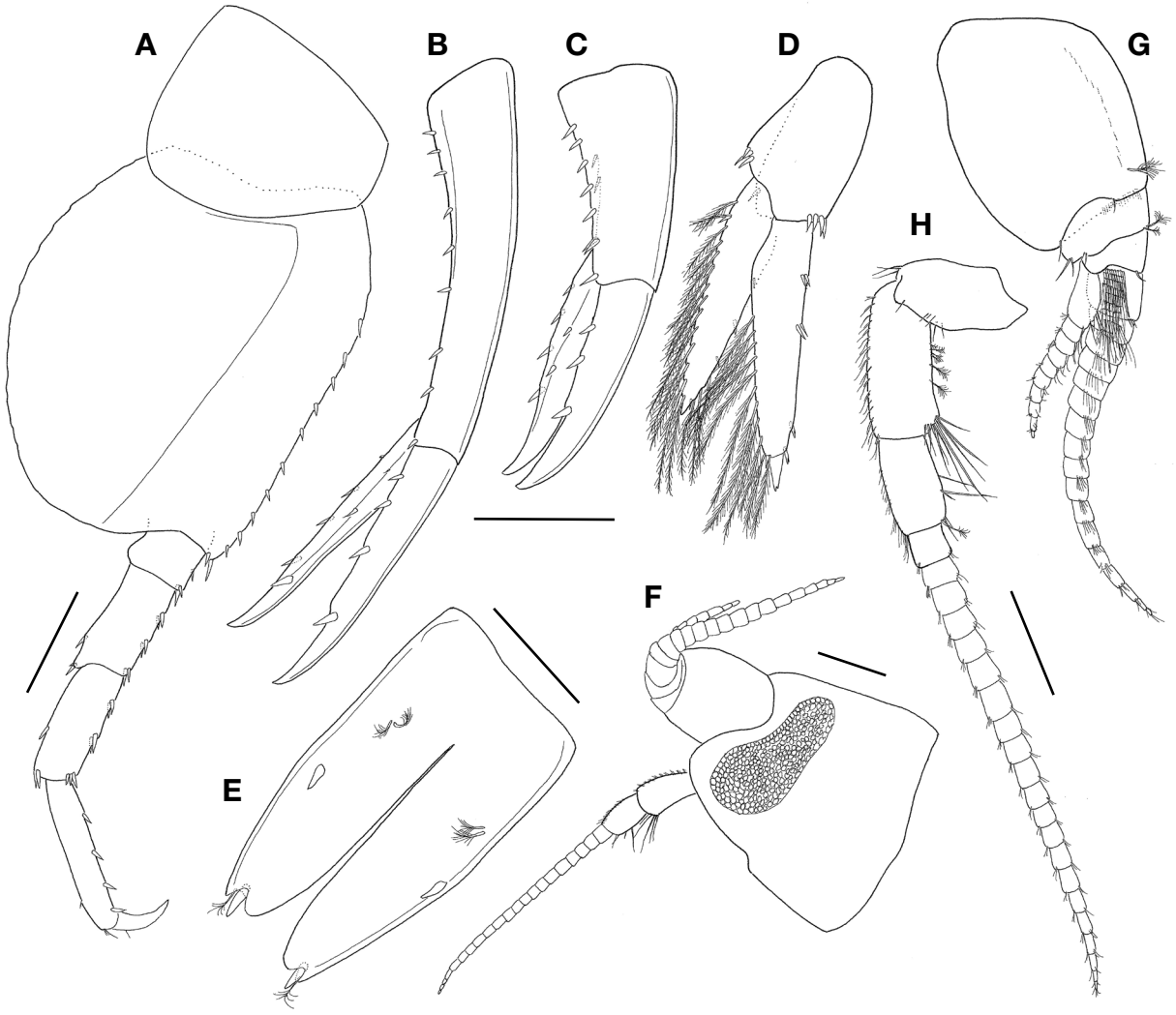

Fig. 4. *Anonyx schefferi* Steele, 1986. A–E, Male, 13.8 mm: A, Pereopod 7; B, Uropod 1; C, Uropod 2; D, Uropod 3; E, Telson. F–H, Female, 15.4 mm: F, Head; G, Antenna 1; H, Antenna 2. Scale bars: A, F=0.5 mm, B–D, G, H=0.4 mm, E=0.2 mm.

angular, slightly narrowing distally, 1.32 times as long as carpus; palm short, serrulate, perpendicular, defined by 2 bifid spines posterodistally; dactylus falcate, slightly exceeding palm, with an accessory tooth.

Gnathopod 2 (Fig. 3B), coxa subquadrate, unarmed; basis linear, elongate, with short simple setae; ischium elongate, with 4 simple setae posterodistally, subequal in length to carpus; merus 0.67 times as long as ischium, with patch of setules posteriorly and cluster of long setae posterodistally; carpus pubescent posterioly and clusters of long setae distally; propodus short, subquadrate, minutely chelate, 0.62 times as long as carpus; dactylus stubby, acute, fitting palm.

Pereopod 3 (Fig. 3C), coxa subrectangular, posterior margin slightly concave, width 0.48 times length; basis narrowing proximally; merus 2.06 times as long as carpus, with 7 setae posteriorly; propodus subrectangular, 1.87 times as long as carpus, with a row of 6 robust spines, 3 long setae; 1 blunt spine hooked and an accessory tooth posteriorly; dactylus falcate, 0.40 times as long as propodus.

Pereopod 4 similar to pereopod 3 except coxa (Fig. 3D) broader than that of pereopod 3, posterior margin excavate, posterodistal lobe produced.

Pereopod 5 (Fig. 3E), coxa large, rounded quadrate, equilobate, width 1.14 as long as length, basis subovate, with a row of spines along anterior margin; merus slightly expanding posteriorly, anterior margin with 4 spines accompanied by simple setae, posterior margin with 4 spines; carpus subequal in length to merus; propodus subrectangular, 1.43 times as long as carpus, anterior margin with a row of 4 spines.

Pereopod 6 (Fig. 3F), coxa small, bilobate; similar to pereopod 5, but each article longer in proportion than pereopod 5.

Pereopod 7 (Fig. 4A), coxa small, widening distally; basis ovate, posterior lobe broadly rounded, width 0.85 times length, anterior margin nearly straight, with a row of spines; ischium to dactylus similar to those of pereopod 6, except ischium and merus without simple setae anteriorly.

Uropod 1 (Fig. 4B), peduncle subrectangular, 1.38 times as long as outer ramus, with row of 8 dorsolateral and 1 apicolateral spines; outer ramus subequal in length to inner one, dorsolateral margin with 4 spines, inner ramus with 4 dorsolateral and 3 medial spines.

Uropod 2 (Fig. 4C), peduncle 0.88 times as long as outer ramus, with row of 7 dorsolateral and 1 apicolateral spines; outer ramus subeqaul in length to inner one, with 3 dorsolateral spines, inner ramus not constricted, with 4 dorsolateral and 2 medial spines.

Uropod 3 (Fig. 4D), peduncle short, 0.69 times as long as outer ramus, with two clusters of 4 spines on both sides; outer ramus 1.10 times as long as inner ramus, biarticulate, proximal article with 11 long plumose setae along medial margin, lateral margin with 2 paired spines proximally and 2 single spines distally; distal article short, 0.13 times as long as proximal one; inner ramus 1.48 times as long as peduncle, reaching end of proximal article of outer ramus, medial margin with 13 long plumose setae, lateral margin with 3 spines and 3 plumose setae.

Telson (Fig. 4E) much longer than broad, cleft about 70% of its length, each lobe with deep apical notch bearing one stout spine and one penicillate seta and one stout spine and a pair of penicillate setae dorsolaterally.

Female (cat No. NIBRIV0000816432): body 15.4 mm long.

Antenna 1 (Fig. 4F, G) similar to that of male; flagellum 17-articulate.

Antenna 2 (Fig. 4F, H) short, 1.30 times as long as antenna 1; peduncular articles 4–5 thinner than those of male; flagellum 21-articulate, much shorter than that of male.

Remarks. The genus *Anonyx* Krøyer, 1838 is similar to genera *Onisimus* Boeck, 1871 and *Tmetonyx* Stebbing, 1906. However, *Anonyx* is distinguished from the two genera as follows: (1) antenna 1 with accessory flagellum (absent in *Tmetonyx*); (2) antenna 2 with brush setae (absent in *Onisimus*); (3) mandible with strong setose tongue on a molar (a reduced column with triturating surface in *Onisimus*, *Tmetonyx*); (4) gnathopod 1, ischium short (elongate in *Tmetonyx*); and (5) gnathopod 1, propodus slightly tapering distally (subparallel in *Tmetonyx*) (Lowry and Kilgallen, 2014). *Anonyx schefferi* Steele, 1986 belongs to the *A. laticoxae* group which has unconstricted inner ramus of uropod 2 and originates from the North Pacific. This species is similar to *A. laticoxae* Gurjanova, 1962 in its appearance and many details of its armature of spines and setae (Steele, 1986). However, *A. schefferi* is distinguished from *A. laticoxae* by an upturned epimeron 3 posteroventally. The female specimen also typically has an upturned projection of epimeron 3 and pereopods 3–4 with a row of long setae each accompanied by a spine. Therefore, our specimens are well accorded with the original description given by Steele (1986).

Distribution. North Pacific, Japan, Korea (East Sea).

Key to species of *Anonyx laticoxae* group

1. Pereopods 3 and 4, posterior margins of propodus with a row of setae and paired spines ····· 2
– Pereopods 3 and 4, posterior margins of propodus with a row of only setae ····· 10
2. Epimeron 3 extends posteriorly with upturned projection ····· 3
– Epimeron 3 extends posteriorly without upturned projection ····· 5
3. Epimeron 3 with large projection posteriorly ····· 4
– Epimeron 3 with small projection posteriorly ····· *A. stegnegeri* Steele, 1986
4. Antenna 1, peduncular article 1 slightly longer than deep; gnathopod 1, propodus slightly longer than carpus ····· *A. schefferi* Steele, 1986
– Antenna 1, peduncular article 1 deeper than long; gnathopod 1, propodus equal in length to carpus ····· *S. multiarticulatus* (Pearse, 1913)
5. Epimeron 3 with small projection posteriorly ····· 6
– Epimeron 3 with large projection posteriorly ····· *A. laticoxae* Gurjanova, 1962
6. Epimeron 2 with tooth posteroventrally ····· 7
– Epimeron 2 without tooth posteroventrally ····· 9
7. Epimeron 2 with small tooth posteroventrally ····· 8
– Epimeron 2 with prominent tooth posteroventrally ····· *A. hurleyi* Steele, 1986
8. Antenna 1, peduncular article 1 deeper than long; gnathopod 1, propodus longer than carpus ····· *A. gurjanovai* Steele, 1986
– Antenna 1, peduncular article 1 depth equal to its length; gnathopod 1, propodus equal in length to carpus ····· *A. petersoni* Steele, 1986
9. Gnathopod 1, propodus narrowed distally ····· *A. affinis* Ohlin, 1895
– Gnathopod 1, propodus not narrowed distally ····· *A. sculptifer* Gurjanova, 1962
10. Epimeron 3 extends posteriorly with upturned projection ····· 11
– Epimeron 3 extends posteriorly without upturned projection ··· *A. exilipes* Jung, Coleman, Kim & Yoon, 2018
11. Gnathopod 1, propodus narrowed distally; gnathopod 2,

propodus expanded distally ····· ····· *A. orientalis* (Gurjanova, 1962)

– Gnathopod 1, propodus not narrowed distally; gnathopod 2, propodus not expanded distally ····· ····· *A. volkovi* Kudrjaschov, 1965

ACKNOWLEDGMENTS

This work was supported by a grant from the National Institute of Biological Resources (NIBR), funded by the Ministry of Environment (MOE) of the Republic of Korea (NIBR 2007).

REFERENCES

Lowry JK, Kilgallen NM, 2014. A generic review of the lysianassoid family Uristidae and descriptions of new taxa from Australian waters (Crustacea, Amphipoda, Uristidae). Zootaxa, 3867:1-92. https://doi.org/10.11646/zootaxa.3867.1.1

Sainte-Marie B, 1992. Foraging of scavenging deep-sea lysianassoid amphipods. In: Deep-sea food chains and the global carbon cycle (Eds., Rowe GT, Pariente V). Kluwer Academic Publishers, Dordrecht, pp. 105-124.

Steele DH, 1979. Zoogeography of the genus *Anonyx* (Crustacea, Amphipoda). Bulletin of the Biological Society of Washington, 3:47-53.

Steele DH, 1982. The genus *Anonyx* (Crustacea, Amphipoda) in the North Pacific and Arctic Oceans: *Anonyx nugax* group. Canadian Journal of Zoology, 60:1754-1775. https://doi.org/10.1139/z82-228

Steele DH, 1983. The genus *Anonyx* (Crustacea, Amphipoda) in the North Pacific and Arctic Oceans: *Anonyx validus* group. Canadian Journal of Zoology, 61:2921-2931. https://doi.org/10.1139/z83-380

Steele DH, 1986. The genus *Anonyx* (Crustacea, Amphipoda) in the North Pacific and Arctic Oceans: *Anonyx laticoxae* group. Canadian Journal of Zoology, 64:2603-2623. https://doi.org/10.1139/z86-380

Steele DH, 1989. The genus *Anonyx* (Crustacea, Amphipoda) in the North Pacific and Arctic Oceans: *Anonyx compactus* group. Canadian Journal of Zoology, 67:1945-1954. https://doi.org/10.1139/z89-278

Steele DH, 1991. The genus *Anonyx* (Crustacea, Amphipoda) in the North Pacific and Arctic Oceans: *Anonyx bispinosus* group. Canadian Journal of Zoology, 69:1600-1611. https://doi.org/10.1139/z91-224

Takekawa A, Ishimaru S, 2001. Two new species of the genus *Anonyx* (Amphipoda: Gammaridea: Lysianassoidea) from Onagawa Bay, Northeastern Japan. Zoological Science, 18:405-416. https://doi.org/10.2108/zsj.18.405

WoRMS, 2018. World Register of Marine Species [Internet]. Accessed 20 Apr 2018, <http://www.marinespecies.org>.

Received February 28, 2018
Revised April 20, 2018
Accepted April 21, 2018